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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,119	04/10/2006	Catherine Chaix	CHAIX	3267

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EXAMINER	
FORD, NATHAN K	
ART UNIT	PAPER NUMBER
1792	

NOTIFICATION DATE	DELIVERY MODE
08/19/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/518,119	CHAIX ET AL.	
	Examiner	Art Unit	
	NATHAN K. FORD	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/15/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Interpretation

By employing *means for* language, the applicant invokes USC 112, 6th paragraph.

Claim 1: The "means for plugging or clearing each of said recesses" will be interpreted as being inclusive of at least a mask according to paragraph forty of the applicant's specification.

Claim 9: The "means for controlling the pressure in order to measure independently the pressure in the first volume and the second volume" will be interpreted as being inclusive of at least a pressure gauge connected to an external pressure control device according to paragraph thirty-six of the applicant's specification.

Claim Objections

Claims 1-13 are objected to because of the following informalities: Claim 1 reads, "said wall includes *des* recesses." Also, claim 12 reads, "the sources placed in the first volume include at least one source *de* plasma." Appropriate correction is required, for the claims must be written entirely in English. To further prosecution, the examiner will interpret *des* to mean at least two recesses, and will translate *de* to mean *of*.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim is generally narrative and indefinite, failing to conform to current U.S. practice. It appears to be a literal translation into English from a foreign document and is replete with grammatical and idiomatic errors. Nevertheless, to further prosecution, the examiner will interpret any disclosure of a second pump which evacuates a volume as reading upon the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 8, 11, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al., US 5,423,914, in view of Tomofuji, US 6,142,097.

Claims 1-3: Nakamura discloses an evaporation device comprising (Fig. 2):

- A vacuum chamber (2) (5, 22-25);
- A wall (21) which divides the chamber into a first (upper) and second (lower) volume (5, 62ff);
- A first pumping unit (20) to pump the first volume (6, 25-30);
- A second pumping unit (1) to pump the second volume (6, 30-33);
- Sources of material (7) placed in the first volume (5, 54-55);
- Sources of material (31, 32) placed in the second volume;
- A recess formed in the wall which is centered on the main axis of the sources of material (6, 16-22);
- Masks (9) for covering the recess (7, 5-8);
    - Wherein each mask is individually controlled.

Nakamura teaches only a single recess formed in the wall, whereas the claim is being interpreted to require at least two recesses. Nevertheless, it would necessitate only a most nominal revision to form two recesses in Nakamura's division wall. Tomofuji, for instance, delineates a dividing wall (4) manifesting three recesses (5a-c) which correspond to individual material sources (10a-c). The recesses enhance control of the vapor stream directed toward the substrates (5, 20-30). Provided with this structural paradigm demonstrating the configuration's art-recognized suitability, it would have been obvious to one of ordinary skill to form an additional recess within Nakamura's wall to achieve the predictable result of controlling the direction and quantity of material passing therethrough.

Claim 4: A gate valve (22), i.e., a plate, covers the recess formed in Nakamura's wall (6, 17-23).

Claim 8: This claim is drawn to the intended use of the apparatus, and it has been held that a recitation concerning the manner in which a claimed apparatus is to be employed does not differentiate the apparatus from prior art satisfying the claimed structural limitations (*Ex parte Masham*, 2 USPQ2d 1647). Nakamura's second pumping unit is capable of evacuating the second volume to a pressure lower than 10^{-7} Torr.

Claim 11: Nakamura states that it is well-known in the art to use electron beam guns in addition to or in place of Knudsen cells (1, 64-67). It would have been obvious to one of ordinary skill in the art to employ electron beam guns to achieve the predictable result of executing substrate deposition.

Claim 13: Material sources 7 may be considered "gas injectors" in that they provide or inject gas into the chamber (5, 54-56).

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura in view of Tomofuji and in further view of Bernard et al., US 2002/0153102.

Nakamura's first and second pump units are not disclosed as comprising primary and secondary pumps. Even so, it is well-known in the art to outfit chamber evacuation units with primary and secondary pumps. For example, Bernard, disclosing an apparatus for conditioning the atmosphere in a vacuum chamber, evacuates the chamber (1) with a pumping system consisting of both a primary (3) and secondary (2) pump [0042]. This pumping arrangement proficiently executes rapid variations in chamber pressure as needed and is also capable of pumping a variable atmosphere. Accordingly, it would have been obvious to one of ordinary skill in the art to equip each pumping unit with primary and secondary pumps to achieve the predictable result of rapidly varying the chamber atmosphere as required by the instant stage of processing.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura in view of Tomofuji and Bernard as applied to claim 5 and in further view of Colombo, US 5,951,767.

Nakamura does not teach liquid nitrogen storage panels disposed in the first volume, but does dispose liquid nitrogen shrouds (6) about the material sources. In supplementation, Colombo, disclosing an MBE apparatus, attests that incorporating cryogenic (liquid nitrogen) storage panels within the chamber walls provides an excellent means for temperature regulation (2, 5-10; 2, 60-65; 4, 10-15). Provided with this teaching, it would have been obvious to one of ordinary skill to integrate liquid nitrogen storage panels throughout the entire chamber perimeter to effectively cool the chamber atmosphere.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura in view of Tomofuji and in further view of Nyberg et al., US 4,654,231.

Nakamura does not explicitly state that a gauge is provided to measure the pressure of the two volumes; the reference does, however, articulate ideal pressure values for each volume, thereby demonstrating a need to quantify the chamber's vacuum condition. Nyberg is cited for the demonstration that it is well-known in the art to, firstly, avail a Bayard-Alpert gauge to assess the pressure condition of a deposition chamber and, secondly, communicate the pressure measurement to a control unit for responsive system adjustment (3, 3-12). It would have been obvious to

one of ordinary skill in the art at the time the invention was made to outfit each vacuum region of Nakamura's apparatus with a pressure gauge and to further relay the result to a controller to permit real-time pressure adjustments.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura in view of Tomofuji and in further view of Demay et al., US 4,813,373.

Nakamura's material sources disposed within the second volume are Knudsen cells which comprise crucibles. The manner of their heating is not disclosed. Nevertheless, as Demay demonstrates, heating evaporation cells via Joule effect is well-known in the art. Specifically, Demay elaborates a deposition system comprising evaporant crucibles (1, 63ff). The crucibles are heated by Joule effect to evaporate the deposition species; further, this technique heats the cell isothermally and obviates difficulties with condensation (6, 5-15). Provided with this attestation of suitability, it would have been obvious to one of ordinary skill to heat Nakamura's Knudsen cells by Joule effect to achieve the predictable result of evaporating the deposition species.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura in view of Tomofuji and in further view of Takahashi, US 5,588,999.

Nakamura does not disclose a plasma source. Takahashi remedies this deficiency in teaching an MBE system which provides plasma to a vacuum chamber to facilitate the formation of oxide films or compound semiconductor films (1, 23-31), which is exactly the end pursued by Nakamura (1, 9-15). Accordingly, it would have been obvious to one of ordinary skill to provide plasma to Nakamura's processing chamber to facilitate the formation of oxide semiconductor films.

Lastly, as the applicant has not demonstrated the criticality of situating the plasma source exclusively in the first volume, it is the examiner's position that disposing the plasma source in either volume would beget equivalent results and its placement is therefore arbitrary – one of ordinary skill would recognize that positioning the plasma source within the first volume would sufficiently enable the formation of an oxide film. It should also be noted that Nakamura's first volume possesses a gas injector (7) capable of supplying a plasma gas. Further, it has been held that rearranging the parts of an invention involves only routine skill in the art (*In re Japikse*, 86 USPQ 70).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan K. Ford whose telephone number is 571-270-1880. The examiner can normally be reached on M-F, 8:30-5:00

EDT. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland, can be reached at 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/N. K. F./

Examiner, Art Unit 1792

/Karla Moore/

Primary Examiner, Art Unit 1792